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ZOOLOGY.

THE PRESERVATION OF THE LOWER ANIMALS.—I have the honor of making known to the class two methods that I have employed at Helgoland, during the last season, for the preparation and preservation of Medusæ, Ctenophoræ, Noctilucae and most of those lower forms, transparent as crystal, which live at the surface of the sea, and which the use of the towing net furnishes in abundance. I submit to the class different Medusæ (Oceania, Geryonopsis), Ctenophoræ and some Noctilucae prepared for several months, and remarkable for their perfect preservation.

One of these methods consists in the use of a weak solution of osmic acid, the other in the use of picric acid.

Osmic acid has been constantly employed in histology, especially for the study of the nerve-terminations, and Max Schultze has made known, by his beautiful researches on the structure of the retina, all the advantages which the use of this reagent presents. Not only does the osmic acid harden the most delicate tissues and organs, allowing us to make fine sections, but it possesses the valuable property of coloring brown, afterwards black, the fatty parts in general, and more particularly myeline. It tints in brown epithelial cells and muscular tissues; it renders very apparent the fibrillar structure of the cylinder of the axis of nervous fibres, and brings out clearly the isolated nerve fibrillæ. Very recently, F. S. Schultz has employed with great success osmic acid for his beautiful histological researches on *Cordylophora lacustris*. This reagent indicates admirably the limits of the cells and brings out well their different characters.

I have used osmic acid to prepare Medusæ and Ctenophoræ, in order to save them from the destructive action of alcohol, in the following manner. The object is placed in a very feeble solution of osmic acid, for a time varying, according to the nature of these minute organisms, from fifteen to twenty-five minutes. After this lapse of time the animals are colored pale brown; the cells of the endoderm and the organs attached to the endodermic layer are alone colored, and the other tissues preserve their original transparence. Thanks to this coloration of the endodermic cellules the gastro-vascular canals are admirably indicated, and the cirrhi become more distinct than in the small, living Medusæ. At the same time all the

tissues harden, and we can then withdraw from the acid solution the objects which have been submitted to its action, wash them carefully several times, and then place them in strong alcohol without running the risk of finally destroying either their elegant forms or the transparence of their tissues. We can even after several weeks, and probably after several months, study the organization and the structure of these delicate beings as well as if we had them living under our eyes.

Another method that I have employed with success consists in the use of picric acid in a concentrated aqueous solution. I have preserved in this liquid, for about six weeks, small *Medusæ* (Oceania) and *Noctiluçæ*. We only notice that the small *Medusæ*, which are perfectly transparent in life, have become plainly opaque. I have examined microscopically some *Noctiluçæ* thus preserved, and can state that they appear just as they came from the sea.—E. VAN BENEDEN.

THE AVI-FAUNA OF COLORADO.—Dr. Coues, in the June number of the *NATURALIST*, criticises the Holden-Aiken list of the Birds of Colorado. So far as his criticism has any pertinence, it would seem to be to complain of the incongruity of grouping in the same list birds found in northern and in southern portions of this territory. If this were the first time that local lists were made, based on political and disregarding natural lines, it would perhaps be worth while to discuss this point. Or I might fall back upon my reserved rights, and, while allowing to my critic the full right to his individual opinion, claim the right to differ, *toto cœlo*. Or I might cite, in extenuation of my offence, a well known list of New England Birds, in which “such birds as” the hooded warbler and the Canada jay “find themselves in ornithological company they never saw outside of a book—” or that of the birds of Arizona, or of South Carolina wherein similar forced associations are only possible *cum longo intervallo*. But my transgression is one for which I propose to make no excuse, and for which I do not need even such illustrious examples; and I would not now have referred to this critique but for an unfortunate error which I deem it important to set right. Facts are more valuable than mere unsupported theory, and illustrations are peculiarly unfortunate when they contradict instead of confirming an hypothesis. Such is the case with my critic. To demonstrate the impropriety of the

Holden-Aiken list, Dr. Coues says "such birds as *Geococcyx Californianus* and *Pipilo mesoleucus* find themselves in ornithological company they never saw outside of a book." Now so far from demonstrating the incongruity of this list, the sentence I quote proves the need of it. It enables us to teach even so good an ornithologist as our critic, and it also shows that it is never safe to argue on merely negative ground. The illustration he has chosen, so far from confirming, refutes his objections. Mr. Aiken informs me that not only are both of these birds found in Colorado, even in the same county, but that he knows positively of several instances in which *G. Californianus* and *P. mesoleucus* have been seen within a few rods of each other. A valid reason might also be urged for the absence, in the list, of any description of *Junco Aikeni*, but it would not interest your readers to hear it: enough that it was both unavoidable in itself, and a postponement rather than an omission.—T. M. BREWER.

MALFORMATIONS.—Last winter one of our pupils at New Brunswick, N. J., communicated the fact that he had purchased, the previous autumn, of a huckster woman in Newark, a pair of young ducks, each having four wings. The woman had twelve for sale, and said that the eggs were laid by a well formed bird; that she hatched a brood of sixteen, every one of them having four wings. The youth said that his birds used both pairs of wings in flying, that is, in moving rapidly on the surface of the pond. They did not live long. Whether this was due to any defective vitality in the birds, or to any extraneous cause, could not be learned.

But we turn from these traditionary facts to a catastrophe, which our own eyes have inspected, as having befallen a family of cats.

About a mile and a half from Freehold, N. J., lives an intelligent family who have had for several years an annual litter of malformed cats. Several years ago a young male cat was brought from Allentown, some twenty miles distant. This cat had a deformity in one front foot, which had six toes. It coupled with a cat of normal form and parts, and a litter of four or five was the result, all with six-toed front feet. The she cat became troublesome, getting into the pantry, and so was sent off. The kittens were disposed of except one. With this the paternal cat united, and the result was four kittens each having six toes on each fore-foot, and five on each hind-foot. This intermixing, as I under-

stand, by this Grimalkin Turk, has gone on for some four years, and to-day, July 29th, I examined one of his daughters, some three months old, which has *six toes* on each of the hind-feet, and *seven toes* on each of the fore-feet. The fore-feet are bifurcated; that is, they have, as it were, each two paws to one foot, the outer paw of each foot being much the larger, and having four toes; and the inner, or smaller paw, on each foot, having three toes. This kitten was one of a litter of four, all malformed precisely alike. On some points I could not get the exact information desired. But I should think that the vitality of these cats is becoming less and less, as they do not become common. To me it seems astounding when I attempt to conceive of the physical equation which enters into this erratic conception—the minuteness of the abnormal material which, plus the normal substance as imparted by the spermatozoön, gives the initial impulse to a result so eccentric. If, as Goethe declared, “It is in her monstrosities that Nature reveals to us her secrets,” one would like to know something of the mode and motive of such a distribution of the life force. During our inspection of Miss Tabbie it was all very well so long as we stroked her back with one hand. She purred as expressive of true feline luxuriousness; and, what is not common, she even licked the other hand as indicating affection. But when we meddled with her extremities, she evidently regarded it as taking personal liberties with unpleasant peculiarities; and instantly rewarded our duplicity by investing in our hand the seven talons concealed in that duplex napkin.—SAMUEL LOCKWOOD.

THE “WILLOW WANDS” FROM BURRARD’S INLET.—I have been able definitely to place the above; referred to by my friend “W. H. D.,” on page 488 of this volume of the NATURALIST, by the receipt in this city of several specimens in good preservation. The “wands” or “switches” prove to be what the majority of scientific gentlemen who had seen specimens, supposed, viz., the central stalks or axes of Alcyonoid polypes, but do not belong to the genus *Umbellularia* as suggested by me, but to a new species of *Pavonaria*, which I have described in the “Mining and Scientific Press” (August 9th) of this city, under the name of *Pavonaria Blakei*. It is a beautiful form resembling in a general way the British species *P. quadrangularis* from Oban. The most perfect specimen, but not the largest, displayed some 245 Δ -like rows,

and numbered about 5000 individual polypes. With *P. Blakei* were received specimens of *Pennatula tenua* Gabb, described in Proc. Cal. Acad., vol. ii.—R. E. C. STEARNS, *San Francisco*.

THE KINGFISHER.—In a recent number of the NATURALIST is a note by Dr. Abbott contradicting Darwin's statements as to the manner in which the kingfisher (*Ceryle alcyon*) takes its food. Permit me to add my testimony in favor of Darwin. Having observed the habits of birds for some years I can say that the kingfisher divides its food by means of its bill, before swallowing. The smaller fish being soft are easily crushed and divided while being swallowed. The larger fish are frequently partially swallowed and so carried to a convenient perch and there disgorged, and then a few strokes of the bill divide it ready for digestion. A dissection of a kingfisher will show the above to be the case.—E. E. BREED, *Duluth, Minn.*

THE "HORNED TOAD."—It may be of some interest to the readers of the NATURALIST to know that the common horned toad (*Phrynosoma cornuta*) produces a large number of young at a single birth. Last summer Mr. George Eddy of this city brought me a toad which had given birth to twenty-five little ones, and two weeks ago (July 14) a boy called after me and showed me a toad which only two hours before had given birth to twenty-seven. The young were exceedingly active and could run as rapidly as the old one.—JOHN WHERRELL, *Leavenworth, Kansas*.

THE BLACK SNOWBIRD BREEDS ON THE GRAYLOCK RANGE.—I have for some time suspected that the black snowbird (*Junco hyemalis*) breeds on the mountains of this region; but I have never found the nest of this bird here till to-day. To-day I found the nest, with two eggs, on one of the hills belonging to the Graylock range. It was on the ground just under the edge of a little bank and was made of dried grasses and lined with black hair.

Jacob Horton, of the senior class in this college, found the nest and eggs of this bird on Graylock a few days ago.—SANBORN TENNEY, *Williams College*, Aug. 6, 1873.

ADDITION TO THE AVI-FAUNA OF AMERICA.—One of the birds obtained by our party in the Aleutian Islands during last season, with an incomplete set of eggs, was forwarded by Prof. Baird (to whom the specimens were submitted) to Mr. Harting of London;

it is the *Tringa crassirostris* of Temminck and Schlegel, a species hitherto known only from eastern China and Japan, and an interesting addition to our northwestern fauna.—W. H. DALL.

GEOLOGY.

ON A FEW MINERAL LOCALITIES WHICH ARE NOT MENTIONED IN THE BOOKS.—Beryl occurs sparingly in the southern part of Sullivan, New Hampshire. I have an absolutely perfect crystal, both terminations perfect, from this place. Dana mentions beryl from Sullivan with a query.

From Alstead, N. H., I have obtained crystals of beryl which have yielded the most beautiful gems. The beryl here is found near the well known mica quarry. In the mica quarry itself there occurs an interesting variety of albite, containing prominent scales of a silvery colored mica. The small crystals of beryl from the old mica quarry are remarkable for their modified terminations.

In Gilsum, N. H., I have obtained crystals of beryl, and fine crystals of mica. I found them in a cut made through the coarse granite, for the highway, between Gilsum and Marlow.

A mile or two northwesterly from the centre of the town of Acworth, N. H., and on the north side of the old highway from this town to North Charlestown, there is a locality of blue kyanite, an account of which, however, I gave at the Troy meeting of the American Association for the Advancement of Science. The kyanite will be seen, by the careful observer, on the stone wall by the wayside, and it is found in place a little to the northward of the wall. A variety of kyanite (fibrolite?) is common in the mica slate of the eastern part of Marlow, N. H. Black tourmaline also occurs in this town.

Plumbago occurs sparingly in the last named town; also more abundantly in Weare, N. H. The fact of its occurrence in Weare may have been recorded before. I am not sure about it.

Acicular crystals of rutile in perfectly limpid quartz occur as bowlders in the southern part of New Hampshire. I have one of these which I obtained in Jaffrey, N. H., but of its exact locality I am not now sure. I may here add that I have a similar specimen from the northern part of Vermont, and from the fact that not a few specimens of this sort have been found in these two states, it is evident that somewhere to the northward there is an important locality of this mineral.—SANBORN TENNEY.